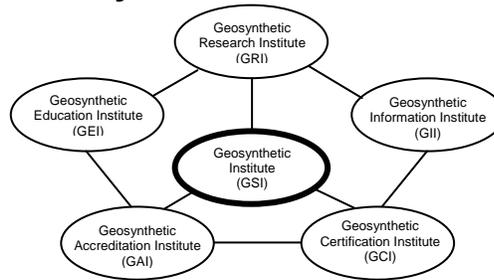


The GSI Newsletter/Report

Geosynthetic Institute



Vol. 21, No. 4

December 2007

This quarterly newsletter, now in its 21th year, presents the activities of GSI and its related institutes to all who are interested. It is available on the institute's home page at www.geosynthetic-institute.org. It also serves as a quarterly report to its member organizations. Details are available by contacting Robert M. Koerner or Marilyn Ashley at phone (610) 522-8440; fax (610) 522-8441 or e-mail at robert.koerner@coe.drexel.edu or mvashley@verizon.net.

*Happy Holidays and a Healthy
and Prosperous New Year*

Activities of the Institute Directors & GSI Board of Directors

NOTICE: Due to the increasing cost of printing, shipping and handling, this Newsletter/Report will be made available on our Home Page at www.geosynthetic-institute.org. It is in the open section under the heading "Newsletter/Report". Please share it with your friends and colleagues.

1. The GRI-21 Conference will be embedded in the GeoAmericas 2008 Conference set for Cancun on March 2-5, 2008. Our twin topics are "Geosynthetics in Agriculture" and "Geosynthetics in Aquaculture". The 14-papers to be presented on March 5th promise to be excellent. Specific details are given later in this Newsletter/Report.
2. At the Cancun Conference we will also have our Annual Meeting, the Board of Directors Meeting, and a Consultants/Test Laboratory Meeting. See the Home Page for details. Regarding the Annual Meeting, if you have topics for us to consider, please advise accordingly.
3. We are also looking forward to the Global Waste Conference set for September 7-10, 2008 near Denver, Colorado. We will have a session on engineered berms at landfills and have also submitted three abstracts for ongoing work with Waste Management Inc. Several focus group meetings are planned.
4. We have signed a contract with IFAI for our GRI-22 Conference. It will be within the timeframe of February 25-27, 2009 and will accompany the Geosynthetics 2009 Conference. The location is Salt Lake City and our specific topic will be:

"The Devil is in the Details"

We hope for a large number of geosynthetic design, manufacturing, and installation details from as many of you as possible. Please think ahead in this regard and advise accordingly.

5. In compiling membership data on a geographic basis we have transitioned from 100% USA membership when we began in 1986 to presently:

63% USA; 12% Europe; 10% Asia; 15% Other

Interestingly, our most recent new members are from South Africa and Israel!

IN THIS ISSUE

- Activities of the GSI Directors and Board
- Overview of GRI Projects (Research)
- Activities within GII (Information)
- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- The GSI Centers-of-Excellence
- Items of Interest
- Preview of Our GRI-21 Conference
- Upcoming Events
- GSI's Member Organizations

6. We are presently in the process of collecting data from our "continuous quality improvement survey". If you have not yet completed the survey please do so as soon as possible. Results will be presented at our next Annual Meeting in March, 2008.
7. Elections for the BoD will begin in January, 2008 since the transition will occur in March of 2008. (It is usually in December).
8. A listing of your GSI Board of Directors follow. Please don't hesitate to contact any of them with respect to GSI activities and programs.

Term Ends 2007*

David Jaros - Corps of Engineers (Government Agencies)

Rex Bobsein - Chevron/Phillips Co. (Resin Producers)

Kent von Maubeuge - NAUE GmbH & Co. KG
(International)

Term Ends 2008

Dick Stulgis - GeoTesting Express (Consultants and Testing Laboratories)

Gary Kolbasuk - Raven (Geomembranes and GCLs)

Mark Sieracke - Weaver Boos Consultants, Inc. (At-Large)

Term Ends 2009

Tony Eith (Chairman) - Waste Management Inc. (Owners and Operators)

Boyd Ramsey - GSE Lining Technology, Inc. (Geotextiles and Geogrids)

Sam Allen - TRI/Environmental, Inc. (At-Large)

*Elections for those whose term ends in 2007 will be this coming January-February.

Overview of GRI Projects (Research)

Each issue of our Newsletter/Report provides a brief glimpse and update of current GRI research projects. Details and full briefings are available to member organizations at their request. Dr. Grace Hsuan, Associate Director of GRI can be contacted for additional information as can the other project managers listed in the following write-ups. **Projects marked with an asterisk have been written up as either short "in-progress" papers or complete papers.** Grace can be reached by phone at (610) 522-8440 or e-mail at <grace.hsuan@coe.drexel.edu>.

1. **Stress Cracking of Geomembranes and Geopipe*** - Dr. Grace Hsuan is project manager of our ongoing efforts to evaluate stress cracking of geomembrane resins and sheets. In addition to her ongoing evaluations of HDPE geomembranes, Grace is presently focusing on HDPE drainage and duct pipe mainly for the Florida DOT. The goal for both geomembranes and geopipe is to include technically viable test methods and limiting values for inclusion in generic specifications.
2. **Durability of Polypropylene Geotextile Fibers**
- Incubation at temperatures of 75, 65 and 55°C

in high oxygen pressure containers is ongoing using PP-woven geotextile fibers. This study periodically measures changes in density, dimensions, mass, morphology, strength, elongation, modulus, melt index, OIT and carbonyl content. Dr. Hsuan is in charge of the project.

3. **In-Situ Temperature Monitoring of Liner and Cover Geomembranes in Dry and Wet Landfills*** - Dr. George Koerner is measuring the in-situ temperature behavior of liner and cover geomembranes and has installed 60± thermocouples for long term measurements in both wet and dry municipal solid waste landfills in Pennsylvania. Presently data for up to 13-years is available. This is clearly the longest in-situ measurement project in all of geosynthetics.
4. **Bioreactor (aka, Wet) Landfill Behavior and Properties*** - The above temperature monitoring has segued into a major effort under sponsorship of GSI and Waste Management, Inc. The wet cell under investigation is at field capacity, hence it is a true anaerobic bioreactor. Dr. George Koerner is in charge of considerable monitoring which includes the following
 - waste moisture content
 - waste temperature
 - leachate chemical analysis
 - waste gas analysis
 - perched leachate within the waste

Data is being collected on a monthly basis. The timeline of the project calls for monitoring for 5 to 10 years. This activity will now extend to an adjacent landfill to see how reproducible the data is with a slightly different waste mass.

5. **Flow Behavior of Fully Degraded Waste*** - A field project under sponsorship of GSI and Waste Management investigates the drainage of highly degraded MSW placed directly on leachate collection systems. The leachate collection systems consist of both natural soils and geosynthetic drains. The project is now in its second year and is at a landfill in the Philadelphia area.
6. **Hydrostatic Creep Puncture of Geomembranes*** - The effect of sustained long-term hydrostatic and geostatic pressures on the puncture strength of geomembranes is an ongoing project. A series of tests using 600 g/m² protection geotextiles on 1.5 mm thick HDPE geomembranes is being evaluated; the time is currently 10-years. The four-test setups use truncated cone simulations of coarse subgrade stones against the geotextile protecting the underlying geomembrane. The behavior of the geomembranes under these tests is a combination of creep and stress relaxation. The purpose of these tests is to better define the creep reduction factor used in the design method.

7. Long-Term Benefits of Geotextile Separators*

- A full-scale field database of using geotextile separators on firm soil subgrades is being developed and maintained by Dr. George Koerner. Monitoring is proposed for up to 20-years. The target sites are paved highways, driveways, parking lots, etc., where control sections without geotextiles are also available for comparison purposes. This database will be national and perhaps even international in scope. Included are sites which meet the following criteria:

- sites must have both geotextile and nongeotextile control sections
- known type of geotextile(s)
- known soil conditions
- known traffic conditions
- available hydrologic and environmental conditions
- capability of quantifying the original condition of the pavement surface vs. the aged condition... this will be accomplished visually as well as by using falling weight deflectometers.

There are currently 14-sites included in this program. If you have additional sites to add, please contact George at (610) 522-8440.

8. UV Exposure of Geomembranes* - GSI is using UV-fluorescent devices to evaluate the simulated outdoor lifetime of nine different types of geomembranes; HDPE, LLDPE, 4 fPPs, PVC, EPDM and PE-R. The effort is considered as part of GSI's Center for Polymers in Hydraulic Structures (CPHyS), but has relevancy in many other applications as well. A keynote paper will be given at the GeoAmericas Conference in March, 2008.

9. UV Exposure of Geogrids - We have recently begun the UV-fluorescent exposure of four different biaxial geogrids which are used at the exposed surfaces of welded wire mesh retaining walls. The geogrids are now up to 7000 light hours and ongoing data is being generated and sent to the respective manufacturers.

10. Generic Specifications - A major effort is ongoing with respect to the development and maintenance of generic geosynthetic specifications. The current status of these specifications is as follows:

Completed and Ongoing

- GM13 – HDPE Geomembranes
- GM17 – LLDPE Geomembranes
- GM21 – EPDM Geomembranes
- GM22 – Exposed Temporary Covers
- GM19 – Geomembrane Seams
- GT10 – Geotextile Tubes

- GT12 – Geotextile Cushions
- GT13 – Geotextile Separators
- GCL3 – Geosynthetic Clay Liners

*An important note regarding textured geomembranes was recently added to the effect that direct interface shear testing should always be performed to assure against slope instability.

Working Within Focus Groups

- GCXX – TRMs for Erosion Control
- GTXX – High Strength Reinforcement Geotextiles

Delayed or Off in the Distance

- GGXX – Bidirectional Geogrids
- GGXX – Unidirectional Geogrids
- GNXX – Geonet Drainage Composites
- GCXX – Drainage Geocomposites

Tabled

- GM18 – fPP & fPP-R Geomembranes

The completed specifications are available to everyone (members and nonmembers) on the open section of our Home Page. Please download and use them accordingly. Also note that this is where the latest modification will always be available.

These specifications are also available as separate power point CDs which show photos of the test devices and can be used as a presentation to your clients and customers, as well as being an in-house training vehicle... don't hesitate to use and share this information which is on the open part of our Home Page.

Activities within GII (Information)

We are currently supporting 2-Home Pages. The first is the GRI Home Page which is accessed as follows:

<<<http://www.drexel.edu/gri>>>

This home page is very introductory as far as GSI members and associate members are concerned, and is meant to be promotional (for prospective students and potential institute members). It is probably only of nominal interest to most readers of this Newsletter/Report.

The second home page is the primary GSI Home Page and is accessed as follows:

<<<http://www.geosynthetic-institute.org>>>

It has been reconfigured through the fine efforts of Marilyn Ashley. Everyone (members and nonmembers) can access the open part, which has the following menu:

- Introduction to GSI
- Prospectus
- Associate Membership (Agencies)
- Members by Focus Groups
- GSI Publications
- GRI Specs, Guides, White Papers
- CPReS
- CPHyS
- Laboratory Accreditation
- Answers to Your Questions
- Newsletter/Reports
- Geosynthetics Links
- GSI Annual Meeting
- GSI Focus Group Meeting
- GSI Short Courses
- Inspector Certification Exams

To go further one needs a members-only password. Your contact person (see the last section of this Newsletter/Report if you do not know who it is) must get a password from Marilyn Ashley. Marilyn can be reached by e-mail at mvashley@verizon.net. When you get into this section, the following information is presented. This includes:

- GRI Test Methods
- GRI Reports (Summaries)
- GRI Technical Papers (Citations)
- Notes of GSI Meetings
- Links to the GSs World
- Keyword Search for Literature
- Example Problems
- Frequently Asked Questions (FAQs)

The keywords section contains about 20,000 citations of all of the geosynthetics literature published in English. It's quite easy to use provided that you have a specific topic, or area, in mind. This is the section that we (and others we are told) use the most in our entire website.

Progress within GEI (Education)

We have scheduled the following sequence of courses for the winter season:

Monday, February 11, 2008
Geosynthetic Design in Waste Containment Systems

Tuesday, February 12, 2008
Quality Control/Quality Assurance of Geosynthetics

The above courses will be held at:
Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033
(approx. 4.5 miles from Phila. International Airport)

Course Registration and Fee:
\$250/person for each one-day course (up to one month prior to course)
\$300/person thereafter
\$150/person – GSI Members

Contact: Marilyn Ashley (mvashley@verizon.net)

Activities within GAI (Accreditation)

The Geosynthetic Accreditation Institute's (GAI) current mission is focused on a Laboratory Accreditation Program (LAP) for all geosynthetic test

methods. George Koerner is in charge of the program. The GAI-LAP was developed for accrediting geosynthetic testing laboratories on a test-by-test basis. GAI-LAP suggests that laboratories use ISO 17025 as their quality system model.

It should be made clear, however, that GAI-LAP does not profess to offer ISO certification, nor does it "certify" laboratory results. GAI-LAP provides accreditation to laboratories showing compliance with equipment and documentation for specific standard test methods, usually ASTM or ISO standards. GAI-LAP verifies that an effective quality system exists at accredited laboratories by way of proficiency testing.

There have been significant additions to the number of GAI-LAP tests. There are currently 169 GAI-LAP methods available for accreditation. Please consult our home page for a current listing.

As of December, 2007, the following laboratories are accredited by the GAI-LAP for the number of test methods listed in parenthesis. Contact personnel and telephone numbers are also listed.

- 1^A - TRI/Environmental Inc. (118 tests)
Sam Allen -- (512) 263-2101
- 3^A - Golder Associates (43 tests)
Henry Mock -- (770) 496-8280
- 4^C - Geosynthetic Institute (114 tests)
George Koerner -- (610) 522-8440
- 6^A - GeoSystems Consultants (27)
Craig Calabria -- (215) 654-9600
- 8^B - Propex, Ringgold (19 tests)
Todd Nichols -- (800) 258-3121
- 9^B - Propex, Alto (10 tests)
Melvin Wallace -- (770) 532-9756
- 11^A - STS Consultants Ltd. (13 tests)
Bill Quinn -- (847) 279-2500
- 13^A - Precision Laboratories, CA (95 tests)
Ron Belanger -- (714) 520-9631
- 14^A - Geotechnics (61 tests)
J. P. Kline -- (412) 823-7600
- 18^A - EMCON/OWT (55 tests)
Rasheed Ahmed -- (845) 492-3170
- 19^A - HTS Inc. (42 tests)
Larry McMichael -- (713) 692-8373
- 20^A - GeoTesting Express, MA (58 tests)
Gary Torosian -- (978) 635-0424
- 22^B - CETCO Arlington Heights (12 tests)
Jim Olsta -- (847) 392-5800
- 23^B - CETCO Cartersville (10 tests)
Sid Weiser -- (706) 337-5316
- 24^B - CETCO Lovell (10 tests)
Roger Wilkerson -- (307) 548-6521
- 25^B - Ten Cate, Pendergrass (11 tests)
Beth Wilbanks -- (706) 693-2226
- 26^B - Agru America Inc. (14 tests)
Grant Palmer -- (843) 546-0600
- 29^C - FITI Testing & Research Institute (70 tests)
Moon-Hyun Jeong -- (011-82-2-960-8034)
- 31^D - NYS Dept. of Transportation (9 tests)
James Curtis -- (518) 457-4735
- 32^A - Vector Engineering (6 tests)
Ken Criley -- (530) 272-2448
- 34^B - GSE Richey Road (16 tests)
Jane Allen -- (281) 230-6726
- 37^B - GSE Chile (16 tests)
Mauricio Ossa -- 56-2 6010153

- 38^C - Sageos/CTT Group (82 tests)
Eric Blond -- (450) 771-4608
- 40^B - GSE Lining Technology Inc. (14 tests)
Charles Miller -- (843) 382-4603
- 41^A - SGI Testing Service, LLC (18 tests)
Zehong Yuan -- (770) 931-8222
- 42^C - NPUST (GSI-Taiwan) (39 tests)
Chiwan Wayne Hsieh -- 011-886-8-7740468
- 43^A - Ardaman & Associates (18 tests)
George DeStafano -- (407) 855-3860
- 44^B - BBA Fiber Web, Inc. (9 tests)
Ken McLain -- (615) 847-7575
- 45^B - Ten Cate Malaysia SDN Bhd. (23 tests)
C. P. Ng -- (603) 519 28568
- 46^B - Bentofix Technologies (13 tests)
Colin Murphy -- (705) 725-1938
- 47^A - Precision Laboratories, TX (13 tests)
Ron Belanger -- (866) 522-0843
- 48^B - Tenax Corporation (9 tests)
Andrew Barker -- (410) 522-7000
- 49^B - Engepol Geossinteticos (20 tests)
George Nastas -- (55) 11-4166 3001
- 50^B - ADS, Inc. Hamilton (7 tests)
Terry McElfresh -- (513) 896-2065
- 51^B - Solmax International Inc. (14 tests)
Guy Elie -- (450) 929-1234
- 53^B - Polytex Inquique (13 tests)
Cristian Valdebenito -- 011 56 57 42 90 00
- 54^B - ADS, Inc. Finley (9 tests)
David Gonso -- (419) 424-8377
- 55^B - Atarfil Geomembranes (21 tests)
Isabel Merida Fernandez -- 34 958 439 278
- 56^B - Polytex Santiago (11 Tests)
Jamie Morales -- 56-2-627-2054
- 57^B - Ten Cate Cornelia (15 Tests)
Melissa Medlin -- (706) 778-9794
- 58^B - Propex Nashville (9 Tests)
Tim Smith -- (229) 686-5511
- 59^B - Firestone (9 Tests)
Janie Simpson -- (864) 439-5641

^AThird Party Independent ^CInstitute
^BManufacturers QC ^DGovernment

If you are interested in this program and would like a copy of the GAI-LAP directory, please advise accordingly. A directory is published annually in December, and is also kept current on GRI's Home page at <http://www.geosynthetic-institute.org>. For additional information on the GAI-LAP program contact:

George R. Koerner, Ph.D., P.E., CQA
Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033-1208
Telephone: (610) 522-8440
Fax: (610) 522-8441
E-mail: gkoerner@dca.net

Activities within GCI (Certification)

A review of GCI's Inspector's Certification Program was given in the September issue of the Newsletter/Report. Since its writing, activity has continued and appears to be intensifying as the winter season sets in.

Date	Location	Candidates Taking Exam	
		Geosynthetics	CCLs
July 11, 2007	State College, PA	7	7
Nov. 28, 2007	Pittsburgh, PA	9	9
Dec. 7, 2007	Austin, TX	8	9
Dec. 12, 2007	Folsom, PA	4	4

These exams have 20% new questions so as to have a completely new exam after 5-years which is the duration of the certification period for each individual. The failure rate appears to be slightly higher than in the past, but we will wait until spring to assess the program with our Steering Committee and report to the membership accordingly. That said, please let George Koerner know of possible exam locations and even courses if so desired <gkoerner@dca.net>.

The GSI Affiliated Institutes

It has long been realized that the information generated within the GSI group should have a timely outlet to all countries, and in all languages. To this end, GSI has created affiliated institutes in two countries (Korea and Taiwan), and potentially many others in the future. These affiliated institutes are full members of GSI and are empowered to translate and use all available information so as to create similar institutes and activities in their respective countries. We introduce these institutes to you in this Newsletter/Report and will present ongoing details of their respective activities.

GSI-Korea was formed on February 9, 1998 as a collaborative effort between FITI Testing and Research Institute (a quasi-government organization) and INHA University (through its Geosynthetics Research Laboratory).

FITI is a 30-year old testing organization located in Seoul focusing on interlaboratory proficiency; environmental protection; safety and flammability; hazardous substances; in-house quality control; consumer protection; complaint analysis; quality marking; procurement; household and industrial applications; and materials approval. It employs 120 people (8 with doctoral degrees) and 42 engineers. The geosynthetics testing group within FITI has 12 people (2 with doctoral degrees) and 10 engineers. The geosynthetic laboratory is GAI-LAP accredited for 70 geosynthetic test methods. Dr. Jeonghyo Kim is the general manager within FITI's geosynthetics activities.

INHA University is located in Incheon (50 km west of Seoul) and the geosynthetics laboratory is led by Professor Han-Yong Jeon. Dr. Jeon has 10-students working on geosynthetic-related projects and is extremely active both nationally and internationally. The ongoing efforts of both FITI and INHA will be described in future Newsletter/Reports.

GSI-Taiwan was formed on August 18, 2000 and is wholly contained within the National Pingtung University of Science and Technology in Nei Pu, Pingtung (southern Taiwan). It completely parallels GSI in that it has specific units for research, education, information, accreditation and certification. The Director is Dr. Chiwan Wayne Hsieh who is a Professor in the Department of Civil Engineering and Director of the Computer Center. GSI-Taiwan has an Taiwanese consortium of geogrid/geotextile manufacturers who work toward producing quality products according to the draft GRI geogrid specifications and the associated test methods. As such, GSI-Taiwan is a GAI-LAP accredited laboratory for 32 geosynthetic test methods. Dr. Hsieh has 10-students working on geosynthetic-related projects and is extremely active nationally and internationally. The ongoing efforts of GSI-Taiwan will be described in future Newsletter/Reports.

The Geosynthetic Institute Centers-of-Excellence

1. The Center for Polymeric Reinforced Structures (CPReS) was formed on Dec. 27, 2002 for the purpose of proper use of geosynthetics in walls, slopes, and foundation reinforcement. It involves Dov Leshchinsky of Delaware, Grace Hsuan of Drexel and George Koerner of GSI as Co-Directors. The mission statement and goals are available on the GSI Home Page at <geosynthetic-institute.org>. Ongoing projects are the following:

- (a) Dov Leshchinsky is modifying and incorporating two important aspects of reinforced walls into his widely-used computer program "MSEWall". They are; design to accommodate short reinforcement lengths when full space is unavailable, and the incorporation of drainage geocomposites in accommodating low permeability backfill soils.
- (b) Grace Hsuan is utilizing the Stepped Isothermal Method (SIM) for assessing the long-term behavior of various geosynthetic reinforcements including geofabric. Graduate student Sang-Sik Yeo, has performed the requisite research and he successfully defended his dissertation in August.
- (c) George Koerner has supervised the construction of a segmental retaining wall at GSI which has 3-different masonry block types. He is measuring the pH-values directly between block surfaces and will do so for many years into the future... the following photograph is of the "GSI Wall". Data is currently available. [As a comment, this wall has geogrid reinforcement between every block layer and is backfilled completely with

AASHTO #57 stone. It will not collapse or even deform]!



2. The Center for Polymers in Hydraulic Structures (CPHyS) was formed on June 20, 2003 for the purpose of proper use of geosynthetics in dams, canals, reservoirs, tunnels, pipes and related hydraulic systems. Jorge Zornberg of the University of Texas at Austin, Grace Hsuan of Drexel, and George Koerner of GSI are Co-Directors. The mission statement and goals are available on the GSI Home Page at <<geosynthetic-institute.org>>. Initial projects are being decided upon, but two are certain.

- (a) Grace Hsuan is focusing on exposed geomembrane durability and lifetime. (See Item 10 previously). This issue is critically important to gain confidence regarding polymer lifetime in the minds of owners, regulators, designers and specifiers in the focused application areas.
 - (b) Jorge Zornberg's activity, via a GSI funded graduate student, Christine Weber, will focus on drainage behind exposed geomembranes on dams.
 - (c) George Koerner's activities are within GSI and focus on the UV fluorescent device.
3. In both CPReS and CPHyS, Bob Koerner acts in an advisory manner and as a peer reviewer. In both centers existing GSI Members and Associate Members are fully entitled to the information that is developed and their interaction is encouraged. No additional funding is anticipated. We will keep the membership advised as to progress in this regard. We sincerely hope that the membership is supportive of these initiatives and your comments/suggestions are always solicited.
4. There is a distinct possibility for additional centers of this type. In particular we are looking to team with a university specializing in CAFO's, i.e., large-scale agricultural operations and possibly aquaculture and mining operations as well. Please contact Bob Koerner with suggestions and ideas.
5. At the suggestion of GSI Board Member, Kent von Maubeuge of NAUE GmbH, we are investigating the possibility of a Center-of-Excellence in the Mining Industry. This would apply to both deep mines (rock falls and bursts) and heap leach mines (liners and collection systems). If any reader has commentary in this regard please advise Bob Koerner accordingly. The activity is in a very formative stage.

Items of Interest

1. **Clean Water Restoration Act (Philadelphia Inquirer, Oct. 8, 2007)**

The world's freshwater supply is stressed like never before. Problems flow from aging pipelines, industrial contamination, flooding, wasteful irrigation, growing demand, climate change and political corruption. By 2025, the United Nations predicts, two-thirds of the world's population will be scrambling for clean water, including parts of the western United States.

Since the 1970's, U. S. water quality has improved dramatically for drinking, recreation and economic uses. But murky U.S. Supreme Court decisions in 2006 and 2001 have muddled clean-water enforcement. A "guidance" from the Army Corps of Engineers and Environmental Protection Agency last week complicated matters further.

The answer is to return to the broader protection assumed by Congress in 1972 and upheld in 1977; That all waters of the United States are protected. America needs seamless water protection. The Clean Water Restoration Act makes definitions clear and ends regulatory confusion.

(Comment: Bob Koerner will deliver a Keynote Lecture in Cancun on March 4, 2008 on "Geosynthetics and Freshwater; a Perfect Marriage")

2. **Atlanta's water supply could be gone in three months (Philadelphia Inquirer, Oct. 21, 2007)**

With the South in the grip of an epic drought and its largest city holding less than a 90-day supply of water, officials are scrambling to deal with the worst-case scenario: What if Atlanta's faucets to do go dry? So far, no real backup plan exists. There are no quick fixes among suggested solutions, which include piping water in from rivers in neighboring states, building more regional reservoirs, setting up a statewide recycling system, or even desalinating water from the Atlantic Ocean.

"It's amazing that things have come to this," said Ray Wiedman, owner of an Atlantic landscaping business. "Everybody knew the growth was coming. We haven't had a plan for all the people coming here?"

State officials warn that Lake Lanier, a 38,000-acre North Georgia reservoir that supplies more than three million residents with water, is less than three months from depletion. Smaller reservoirs are dropping even lower, forcing local governments to consider rationing. Scorching summer temperatures and a drier-than-normal hurricane season fueled the drought. State climatologist David Stooksbury said it would take months of above-average rainfall to replenish the

system. He is now predicting the drought could worsen the winter bring little rainfall.

"I tell people, we need 40 days and 40 nights," he said with a sigh.

3. **Gold Prices, riding oil's coattails, hit \$800 an ounce (USA Today, Nov. 1, 2007)**

The forces behind oil's rise also are boosting other commodities. For instance, gold for December delivery surged to \$800 an ounce Wednesday on the New York Mercantile Exchange, the first time since 1980.

Hard assets, such as gold and silver, tend to rise in values when paper currency, such as the U.S. dollar, falls.

Gold prices have surged more than \$100 an ounce in two months as a weak dollar, record oil prices and concerns about world political tensions have increased the allure of precious metals.

Global investors seek the highest returns they can get safely. When U.S. interest rates fall relative to European rates, as they did again Wednesday with the Federal Reserve rate cut, money flows out of dollars and into euros, driving down the value of the dollar.

The sharp rise in gold prices hasn't scared off investors yet – quite the opposite, according to George Milling-Stanley, spokesman for the World Gold Council.

"One of the things that has characterized the bull market since April 2001 is that investors have perceived every dip in the price as a buying opportunity," Milling-Stanley said. "They have perceived gains also as a buying opportunity."

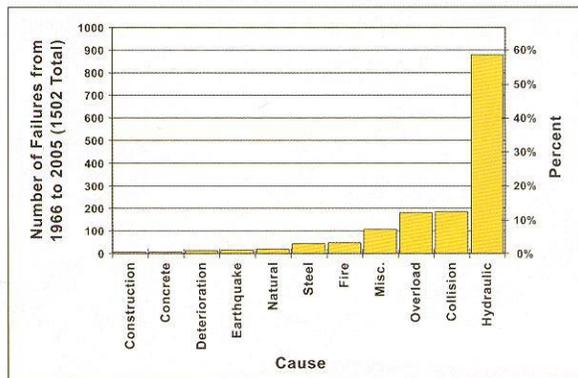
There is evidence of that buying trend: As the price of gold has risen on the futures market, investors have poured money into exchange-traded funds that track gold.

The StreetTracks Gold Shares ETF has seen inflows swell 16% since Aug. 31 to \$19.2 billion, while the futures price of gold has climbed about 17%.

(Comment: GSI's interest in a Mining Center of Excellence follows along with this type of information)

4. **Some thought's on bridge failures (J. L. Briaud, Geo-Strata, Sept./Oct., 2007)**

To counterpoint the tragic failure of the recent I-35W bridge collapse in Minneapolis, it should be recognized that there have been 1500 bridges in the USA that have collapsed between 1966 and 2005. As is seen in the following bar-chart, hydraulic causes are by far the most troublesome. Since geosynthetics are the key toward erosion control and scour prevention it seems to your editor that some excellent opportunities exist.



5. Visits to the GSI Home Page

We were amazed to learn that our Website (geosynthetic-institute.org) has had well over 1000 hits per day between November 2006 and October 2007... data follows:

Month	Daily Average			
	Hits	Files	Pages	Visits
Oct 2007	1458	843	666	318
Sep 2007	1101	677	539	269
Aug 2007	1258	779	633	305
Jul 2007	1262	779	633	305
Jun 2007	1393	836	713	438
May 2007	1270	731	571	294
Apr 2007	1493	852	649	323
Mar 2007	1333	820	618	316
Feb 2007	1184	718	546	294
Jan 2007	1321	783	643	341
Dec 2006	1222	726	614	328
Nov 2006	1080	690	503	260

It would be fascinating to know who all these people are??? One data point, however, is that we included an item "Answer Your Questions" to our website in October which linked the questions directly to the GMA Techline, which we service. The "traffic" went up three-fold immediately.

Preview of Our GRI-21 Conference

The closely related topics of agriculture and aquaculture are the focus of our 21st Annual Conference to be held on March 5, 2008 in Cancun, Mexico. As the date suggests our conference will be "nested" within the larger GeoAmericas 2008 conference which is being held at the same location between March 2-5, 2008. For complete conference details, registration, and hotel information contact <www.geoamericas.info>.

Of course, geosynthetics has direct applicability to the topics mentioned above and the one-day GRI-21 event is divided equally between the two topics differentiated

mainly between land-grown versus water-grown food products. As will be seen, opportunities abound in both areas for geosynthetic solutions.

The morning session, focusing on geosynthetics in agriculture, will have six presentations on diverse topics such as; increased fruit harvesting, better water storage, and innovative handling of animal waste, e.g., bags, liners, covers, and polymer additives. George Koerner will moderate this session which will include questions from the audience and answers from the presenters.

The afternoon session, focusing on geosynthetics in aquaculture, will have seven presentations on topics such as; turbidity curtains, fish hatchery and shrimp farm liners, loads on fish nets, underwater habitats, health aspects and artificial reefs. Grace Hsuan will moderate this session which will also include questions from the audience and answers from the presenters.

Lastly, a presentation by Bob Denis of Solmax International will address the need for ongoing research by the entire geosynthetics community so as to continue and sustain the vitality of geosynthetics to everyone concerned. The draft program in abbreviated form follows. Please join us for what promises to be an exciting program.

GRI-21 Conference Geosynthetics in Agriculture and Aquaculture Wednesday, March 5, 2008

Morning Session (10:00 to 12:30) – Geosynthetics in Agriculture (George Koerner – Moderator)

1. Geosynthetic Use to Facilitate a Double Fruit Harvest in Taiwan – Wayne Hsieh of NPUST
2. Geosynthetic Capillary Barrier for Increased Water Storage – John Allen of TRI/Environmental and John McCartney of University of Arkansas
3. Agriculture Bags and Bio-Digesters – George Koerner
4. Animal Waste Lagoon Liners Using GCLs – Jim Olsta of CETCO
5. Odor Control Floating Lagoon Cover – Roy G. McClinton of Huesker, Inc.
6. Designer Additives for Geomembranes in Agriculture – Gary Kolbasuk of Raven Ind.

Note: These are consecutive 10-minute presentations, followed by a coffee break, followed by a panel of all speakers to field Q & A's from the audience; lunch follows.

Afternoon Session (2:00 to 5:30) – Geosynthetics in Aquaculture (Grace Hsuan – Moderator)

7. Turbidity Curtains – George Koerner of GSI
8. In-land State Fish Hatchery in South Dakota – Firestone and Comanco Joint Presentation

9. Wave and Current Loads on Fish Net Cages and Pens – Rich Weggel of Drexel University
10. Anchored Geosynthetic Underwater Habitats – Ian Peggs of I-CORP
11. Shrimp Farm Liners in Indonesia – Boyd Ramsey of GSE
12. Health Aspects of Fish Farms and Bacteria Removal – Wayne Hsieh of NPUST
13. Geotextile Tubes as Artificial Reefs – Grace Hsuan of Drexel University

Note: These are consecutive 10-minute presentations, followed by a soft-drink break, followed by a panel of all speakers to field Q & A's from the audience.

14. "The Need of Ongoing Research for the Health and Welfare of the Geosynthetics Industry" – Bob Denis of Solmax, Intl.

Upcoming Events

- January 29-31, 2008
ASTM D35 on Geosynthetics
Tampa, Florida
Contact: <csierke@asmt.org>
- February 11, 2008
Landfill Design Course
February 12, 2008
QC/QC of Geosynthetics Course
February 12, 2008
GS and GCL Exams
Above are at GSI, Folsom, PA
Contact: <mvashley@verizon.net>
- March 2-5, 2008
GeoAmericas
Cancun, Mexico
Contact: <jmrutledge@ifai.com>
- March 11-13, 2008
Mining and Waste Management
Gauteng, South Africa
Contact: <lesley.stephenson@wits.ac.za>
- June 17-20, 2008
Geosynthetics Asia 2008
Shanghai, China
Contact: <ccigs@4acq-2008sh.com>
- June 25-27, 2008
ASTM D35 on Geosynthetics
Denver, Colorado
Contact: <csierke@astm.com>
- September 7-10, 2008
Global Waste Mgmt. Symposium
Cooper Mountain, CO
Contact: <www.wastesymposium.com>
- September 7-10, 2008
EuroGeo 4
Edinburgh, Scotland
Contact: <eurogeo4@eurogeo4.org>

GSI's Member Organizations

We sincerely thank all of our sponsoring organizations. Without them, GSI simply could neither happen nor exist. The current GSI member organizations and their contact members are listed below. The newest member organizations are the Massachusetts Department of Environmental Protection, Aquatan (Pty) Ltd. of South Africa and PRS Mediterranean Ltd. of Israel. A sincere thanks to all of them and welcome!

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IN THE NEXT ISSUE

- Activities of the GSI Directors and Board
- Overview of GRI (Research) Projects
- Activities within GII (Information)
- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- The GSI Centers-of-Excellence
- Items of Interest
- Review and Analysis of the GRI-21 Conference
- GSI's Member Organization